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United States and territory policies supporting maternal and neonatal transfer: review of transport and reimbursement

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Abstract

OBJECTIVE—Summarize policies that support maternal and neonatal transport among states and territories.

STUDY DESIGN—Systematic review of publicly available, web-based information on maternal and neonatal transport for each state and territory in 2014. Information was abstracted from published rules, statutes, regulations, planning documents and program descriptions. Abstracted information was summarized within two categories: transport and reimbursement.

RESULTS—Sixty-eight percent of states and 25% of territories had a policy for neonatal transport; 60% of states and one territory had a policy for maternal transport. Sixty-two percent of states had a reimbursement policy for neonatal transport, whereas 20% reimbursed for maternal transport. Thirty-two percent of states had an infant back-transport policy while 16% included back-transport for both. No territories had reimbursement or back-transport policies.

CONCLUSION—The lack of development of maternal transport reimbursement and neonatal back-transport policies negatively impacts the achievements of risk-appropriate care, a strategy focused on improving perinatal outcomes.

INTRODUCTION

Risk-appropriate care during the perinatal period, or perinatal regionalization, is a coordinated, tiered system of service provision that provides high-risk obstetric patients with access to well-equipped and staffed resources including Neonatal Intensive Care Units.[1–4] Perinatal regionalization directs patients to the best resourced and skilled locations based on risk[3] and is an important component of care for very premature and very low birth weight neonates.[5] Recent research indicates that infants who receive care at higher level facilities have higher rates of survival than those receiving care at lower level facilities.[5] Regionalized

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

perinatal networks are designed to centralize advanced care technology and skills for high-risk neonates and mothers, using well-defined care capability levels for both women and infants.[3,6,7] In the ideal clinical network, with well-defined policies, delivery of care occurs within a designated perinatal region through identification of high-risk maternity patients who are appropriately transferred (from one facility to another) during the antenatal period.[8,9] An ideal system would also transport (the physical movement of the patient via ground, air or water vehicles) convalescing neonates and mothers back to community facilities to eventually transition home or into community care.

Changes from a cooperative model of perinatal health care delivery towards a competitive model in some regions of the United States,[10–12] and the varying perception of the viability of very low birth weight/preterm infants,[13] has contributed to a rapid increase in the number of hospitals that offer specialized care for high-risk neonates. Thompson *et al.*[14] found that the United States had a birth density of neonatologists (neonatologists per 10 000 live births) 1.7 and 1.8 times higher than Australia and Canada, respectively, and 2.3 times higher than the United Kingdom; such high density in resources and work-force resulted in the 'de-regionalization' of care for at-risk neonates.[10,12]

To better understand how de-regionalization of care has affected maternal and neonatal transfers, studies have examined factors influencing timely referral of obstetric patients (maternal transfer) or neonates (neonatal transfer) to institutions with appropriate resources for both high-risk maternal and infant care. Studies have focused on transport indices/scores such as the Transport Risk Index of Physiologic Stability (TRIPS), California TRIPS and Mortality Index for Neonatal Transportation;[15–19] as well as referral patterns,[20] methods of communication,[21,22] insurance type/status,[23–25] and ground transport times. Researchers concluded that these factors impact transfers and ultimately, patient health.[26]

Despite single[10,22,27–31] and multi-state[32–34] studies on perinatal regionalized systems, generalizability of findings is limited. No study has examined the scope of transfer policies and regulations within and among all United States and territories. As effective regionalization involves not only facilities with defined care capabilities but also timely and coordinated referral of obstetric and neonatal patients, an assessment of maternal and neonatal transfer policies provides insight into the organization and potential effectiveness of perinatal regionalization in the United States. Therefore, the objective of this study is to summarize two essential components of maternal and neonatal transfer policies – transport and reimbursement – among US states and territories.

MATERIALS AND METHODS

Study design

A systematic review of web-based, publicly available information on maternal and neonatal transport policies and legislation was conducted for each US state and territory in 2014. All policies and legislation published by state agencies, state governments or territories were examined for inclusion in the study. Facility-level and/or hospital system policies were not included in this study unless associated with the state or territory legislation addressing transport. Federal-level polices from the territories that were not directly mentioned in the

publicly available information were excluded (for example, any US military aid provisions). Tribal policies developed for use on federally recognized American Indian/Alaska Native reservations were excluded. Finally, city jurisdictions were excluded from analysis as city policies were potentially linked to state policies (for example, New York City, Los Angeles and Washington DC). A standardized search strategy was implemented based on multiple search terms using search engines such as Google, Bing and State websites (Table 1). Available policies, rules, codes, licensure regulations, health planning documents, state agency program descriptions and statewide non-governmental perinatal health entity publications were identified for data extraction. Results of the initial search were used to further expand the search strategy. Information was abstracted using a standardized template by a team of four data abstractors.

Data collection process

The United States was divided into the 10 Health Resources Services Administration regions and the territories in order to facilitate an organized search process. Two regions were searched separately and simultaneously by two abstractors. Each abstractor then independently cross-referenced the search findings of the other, completing double-data entry of source information. Study authors (DAG and SML) further validated 20% of the abstracted state and territory information. Discrepancies were reconciled during in-person meetings among study researchers (DAG, CDK, SML and EMO) and data abstractors to ensure consistency in the search strategy and data entry.

Data summary process

The primary abstractor reviewed and created an initial summary of all abstracted data. The secondary abstractor reviewed this summary, verified all summary information using the abstracted data and identified an initial list of broad topical areas. Researchers and abstractors reviewed the summary data and topical areas to identify relevant categories, subsequently grouping topic summaries within each category. The categories identified for this study fell into two groupings: (1) overall presence of state-level policy on maternal and/or neonatal transport, back-transport (defined as return maternal and/or neonatal transport to hospital of origin), and establishment of transfer agreements and transport policies within and between state hospital systems as well as regional perinatal centers (inter-hospital transport); and (2) reimbursement for transport services (neonatal and/or maternal), reimbursement for back-transport (neonatal and/or maternal), and reimbursement by Medicaid. Medicaid reimbursement was assessed as either present or absent within an established policy and not by type of transport.

Statistical methods

Descriptive statistics were used to analyze the abstracted information. Counts and percentages of US states and territories with identified policies or legislation were reported and variations of policies and legislation are described. This study was determined to not need Institutional Review Board review at the Centers for Disease Control and Prevention because it did not include human subjects.

RESULTS

State-level neonatal and combined maternal/neonatal transport policies

Transport to appropriate level of care—Thirty-four (68%) of the 50 states had an established state-level policy for neonatal transport, whereas six states (Alabama, Arkansas, Indiana, Minnesota, Washington and West Virginia) had a recommendation for development of a state-level policy for neonatal transport (Table 2). Of the remaining 10 states, four (Kansas, Maine, New Hampshire and Vermont) had no reported policy statement; five had a policy (Connecticut, Hawaii, Idaho, Oregon and South Dakota), but not at the state level, and Nebraska had a state policy that only addressed neonatal transport for metabolic conditions. Thirty of the 50 states (60%), had a state-level policy specific for maternal transport. Of the eight territories, American Samoa and Commonwealth of Northern Mariana Islands had territorial-level transport policy statements while Guam had a hospital-level policy for neonatal transport. The remaining territories had either no policy statement (Puerto Rico and US Virgin Islands) or the policy statement was not specific to maternal or neonatal transport (Federated States of Micronesia, Republic of Palau and Marshall Islands).

Back-transport—Only 16 of the 34 states (47%) with a transport policy noted a back-transport component. Eight (24%) had a back-transport policy for neonates alone, whereas the remaining eight (24%) had a back-transport policy that included both the mother and neonate. Nineteen (56%) of the 34 states with a state-level policy did not specifically address back-transport, either maternal or neonatal, in their state-level policy.

Inter-hospital transport—Among the 34 states with a state-level transport policy, 24 (71%) specified an inter-hospital transport policy. Three states (Maryland, Massachusetts and Wyoming) and one territory (American Samoa) had language specific for coordinating out-of-state/territory transport.

Transport reimbursement

Reimbursement policy—Thirty-one (62%) of the 50 states had language in their policy regarding financial reimbursement for neonatal transport (Table 3). Of the 31 states with a reimbursement policy for neonatal transport, 10 states (32%) also had a reimbursement policy specified for maternal transport.

Among the eight territories, only American Samoa had a specified reimbursement policy; however, that policy is currently suspended.[35] Three territories (Guam, Puerto Rico and US Virgin Islands) had no reimbursement policy, whereas the remaining four (Commonwealth of Northern Mariana Islands, Federated States of Micronesia, Republic of Palau and Marshall Islands) had reimbursement policy language that was not specific to either maternal or neonatal transport.

Reimbursement for back-transport—Among the 31 states with a transport reimbursement policy, 25 states (81%) and American Samoa did not specifically address back-transport reimbursement (Table 3). Of the six states which did specify back-transport, neonates are mentioned; none specified reimbursement for maternal back-transport.

Medicaid transport reimbursement—Overall, 19 states (38%) specified a Medicaid-related payment option for transport reimbursement, which represented 61% the 31 states with an identified reimbursement policy (Table 3). American Samoa included specific language for Medicaid reimbursement in its currently suspended policy.

DISCUSSION

Monitoring and facilitating transfer of at-risk maternal and neonatal patients operationalizes risk-appropriate care. Presented here is the first summary of the maternal and neonatal transport polices within the 50 US states and eight territories. Only two-thirds of states have developed state-level policies to address neonatal transport for risk-appropriate care and well-defined policies for inter-hospital transfers. In addition, fewer than two-thirds of states have developed a policy for maternal transport, a key strategy in improving the survival of high-risk infants.[6] Among states with existing transport policies, fewer than one-half have specified back-transport policies. However, states with neonatal transport policies typically have well-developed reimbursement components, particularly for neonatal transport within Medicaid. Reimbursement for maternal transport is addressed in policy by only one-fifth of states. Finally, the majority of US territories do not have well-defined maternal or neonatal transport policies, which could critically impact the transfer of patients from remote areas to facilities with risk-appropriate capabilities.

A major achievement of perinatal regionalization is the development of antenatal and neonatal transport policies within and between state hospital systems.[36] A benefit of a well-designed inter-state/region hospital transport service is the timely provision of care, an important component of regionalized systems.[4] Fully developed transport policies address issues to reduce lack of insurance status (for example, private vs Medicaid vs none),[23–25,37] distance from appropriate hospital[38] and competition for patients,[39] to ensure efficiency in transfer and receipt of care. In an ideal setting, a good system functions independently of insurance status, prepares for the challenges of distance and allocates resources to address competitive market forces.

Despite technology driven progress on neonatal survival,[29] the uterus remains the optimal mode of transport for a developing fetus.[40] Antenatal transfers lead to better neonatal survival when compared with postnatal transfers,[41,42] decreases in short and long-term disabilities and costs,[43–46] and increased bonding between a mother and her critically ill newborn.[43] However, the evidence for the specific advances gained with perinatal regionalization is not as well-defined for obstetric care. Over time, perinatal services have been defined separately for maternal and neonatal care, contributing to a break in the continuity of care during labor, delivery and recovery. Sinkin *et al.*[4] found that managed care availability was not equally distributed in all regions and remained a significant obstacle for maternal transfer; in some regions a high-risk pregnancy is followed by the maternal–fetal specialist, whereas in others, the specialist acts as a consultant, playing a limited role in labor and delivery.[4] In addition, differences in perinatal regionalization legislation or financial incentives to hospitals may impact which hospitals establish a lower or higher-level NICU.[33]

Equally important in the concept of transport is the return of convalescing neonates, or back-transport, to lower-level hospitals for recovery care and community support. Back-transport is a method of achieving risk-appropriate care, in a resource-efficient manner when tertiary care is no longer indicated.[47] Returning infants to their community hospitals supports familial bonding and eases financial and emotional stress on parents,[48] strengthens the patient-provider relationship,[49] decreases the impact of adverse effects on outcomes for the infant, improves efficiency of NICU bed utilization[37,50–52] and generates net cost savings.[37,53] Although it is important to recognize that cost savings can be impacted by longer periods of hospitalization for back-transported infants. Bose *et al.*[53] concluded that the 34% reduction in cost for back-transporting neonates was offset by a 21% increase in cost required to keep the convalescent infant in the community hospital.[53]

Despite these benefits, the current results indicate that most states did not specify a back-transport policy. Lack of back-transport policy development in states may directly reflect the disparity between costs and reimbursement. For instance, a hospital that is receiving reimbursement for care of an infant is not incentivized to back-transport the infant, since convalescing care reimbursement would be received by another institution.[54]

Likewise, maintenance of funding is essential for sustaining perinatal regionalized systems; fewer than two-thirds of states and one territory specifically addressed reimbursement for transport. All states with a reimbursement policy included payment for neonatal transport, while fewer than one-third of those with a policy also included a reimbursement for maternal transport. However, the majority of states that had a reimbursement policy also included reimbursement from Medicaid; which finances an estimated 40 to 50% of all births in the United States.[55,56] In addition, the Medicaid population is the largest at-risk group and consumer of risk-appropriate care.[57,58] During the 2009 Association of Maternal and Child Health Programs Perinatal Regionalization meeting, multiple state presentations referenced budget cuts as a barrier to improvements in risk-appropriate care.[59] It is possible that states without reimbursement policies lack the resources necessary to consider developing policies on reimbursement when considering overall cost reduction efforts.[54] Without proper funding, long-term sustainability of a comprehensive perinatal regionalization system would be difficult for any state.[29] Incorporating other systems of risk-appropriate care, such as disaster preparedness, could provide efficient use of resources in perinatal care.[60] During economically challenging times, it is critical that budgeting for maternal and neonatal transport be well defined, because appropriate reimbursement incentivizes compliance with regionalization policies.

There are several limitations to this study. The researchers did not contact states directly to obtain additional information regarding state policies. Also, as the internet is a fluid environment, it is possible that states may have updated information that was not available during study data collection. Lastly, since perinatal regionalization is often defined by state and/or regions within a state, the researchers are not able to include an analysis of policies developed at the local, network or hospital level. Regardless of these potential limitations, the presence of state-level transport policies suggest that states are making efforts to support risk-appropriate care.

CONCLUSION

This systematic review provides a summary of transfer policies for all 50 US states and eight territories. Although more than half of states and a few territories have well-developed transport policies, back-transport policies – critical for convalescing mothers and infants – have been minimally implemented. States and territories with transport policies have reimbursement policies, though reimbursement is focused on neonatal transport. Monitoring maternal and neonatal transport and reimbursement as it relates to perinatal regionalization in the United States is essential as resource constraints require targeted decision-making by states, health officials, hospital systems, hospital administrators and insurance providers. Readily available information related to perinatal regionalization, as presented here, informs allocation and redistribution of resources targeting improvement in the efficiency, effectiveness and quality of risk-appropriate care for mothers and infants.

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Table 1

Summary of search terms used for data collection and abstraction

Individual search terms ('State' was included in subsequent searches and variations of search phrases were subsequently searched)
(State) perinatal transport
(State) perinatal program
(State) perinatal transport coordination
(State) neonatal transport
(State) neonatal transport program
(State) neonatal transport program coordination
(State) neonatal policy
(State) antenatal transport
(State) antenatal policy
(State) antenatal transport coordination
(State) maternal transport
(State) maternal transport coordination
(State) obstetric transport
(State) obstetric transport coordination
(State) perinatal transport reimbursement
(State) neonatal transport reimbursement
(State) maternal transport reimbursement

Table 2

Summary of states and territories with a policy for neonatal transport

State/territories	Includes a policy for maternal transport[a]	Has policy for back-transport of infants[b]	Has policy for inter-hospital transport[c,d]
Alaska	Yes	—	Yes
American Samoa	—	—	Yes[e]
Arizona	Yes	Yes[f]	Yes
California	Yes	—	—
Colorado	Yes	—	Yes
Commonwealth of Northern Mariana Islands	Yes	—	—
Delaware	Yes	—	Yes
Florida	Yes	—	Yes
Georgia	Yes	Yes	Yes
Illinois	Yes	Yes[f]	Yes
Iowa	Yes	—	Yes
Kentucky	Yes	—	—
Louisiana	Yes	Yes	Yes
Maryland	Yes	Yes[f]	Yes[e]
Massachusetts	Yes	Yes[f]	Yes[e]
Michigan	Yes	Yes[f]	Yes
Mississippi	Yes	Yes	—
Missouri	—	—	—
Montana	—	—	—
Nevada	Yes	Yes	Yes
New Jersey	Yes	Yes	Yes
New Mexico	Yes	—	Yes
New York	Yes	Yes[f]	Yes
North Carolina	—	—	—
North Dakota	Yes	—	—
Ohio	Yes	Yes	Yes
Oklahoma	Yes	—	—
Pennsylvania	Yes	—	—
Rhode Island	—	—	Yes
South Carolina	Yes	Yes	Yes
Tennessee	Yes	—	Yes
Texas	Yes	Yes[f]	—
Utah	Yes	Yes[f]	—
Virginia	Yes	Yes	Yes
Wisconsin	Yes	—	Yes
Wyoming	Yes	—	Yes[e]

[a]The dashes in this column represent transport policies that do not specify maternal transport.

[b]The dashes in this column represent transport policies that do not specify back-transport.

[c]The inter-hospital transports are either among health care systems or a joint coordination between a hospital and a coordinating entity such as regional perinatal centers.

[d]The dashes in this column represent transport policies that do not specify inter-hospital transport.

[e]The inter-hospital transports are done or can be done out-of-state/territory.

[f]The back-transport policy does include maternal transport.

Table 3

Summary of states and territories with a reimbursement policy for neonatal transport

States/territories	Includes a reimbursement policy for maternal transport[a]	Has a reimbursement policy for back-transport[b]	Has a Medicaid transport reimbursement policy[c]
Alabama	—	—	—
American Samoa[d]	—	—	Yes
Arizona	Yes	Yes	—
California	—	—	Yes
Colorado	—	—	Yes
Delaware	—	—	—
Florida	Yes	—	Yes
Georgia	Yes	—	Yes
Hawaii	—	—	Yes
Idaho	—	—	Yes
Indiana	—	—	Yes
Louisiana	—	—	Yes
Maine	—	—	—
Maryland	Yes	—	—
Massachusetts	—	—	—
Michigan	—	Yes	Yes
Minnesota	Yes	Yes	—
Montana	Yes	—	Yes
Nevada	Yes	Yes	—
New Hampshire	—	—	Yes
New Jersey	Yes	—	Yes
New York	—	Yes	Yes
Oklahoma	—	—	—
Oregon	—	—	—
Rhode Island	—	—	—
South Dakota	—	—	Yes
Tennessee	Yes	—	—
Utah	—	Yes	Yes
Virginia	—	—	Yes
Wisconsin	—	—	Yes
Wyoming	Yes	—	Yes

[a] The dashes in this column represent transport reimbursement policies that do not specify maternal transport.

[b] The dashes in this column represent transport reimbursement policies that do not specify back-transport.

[c] The dashes in this column represent transport reimbursement policies that do not specify Medicaid.

[d] This transport reimbursement policy is currently suspended.